



THIRD SPACE
LEARNING

8th Grade Arkansas State Practice Math Test

Arkansas Practice Test Grade 8

Grade 8

Questions

Name:

Class:

Date:

Score:

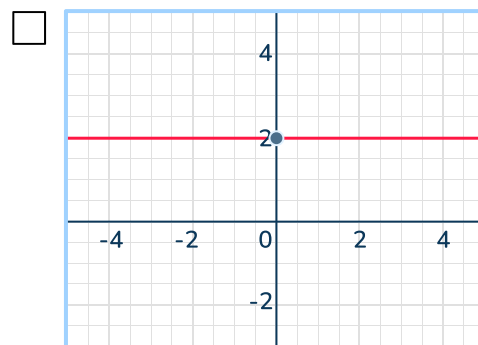
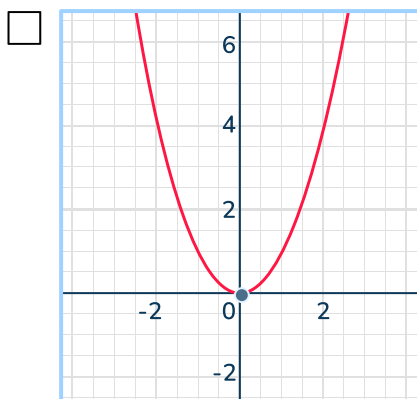
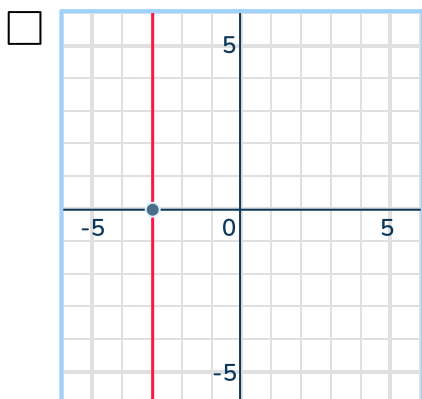
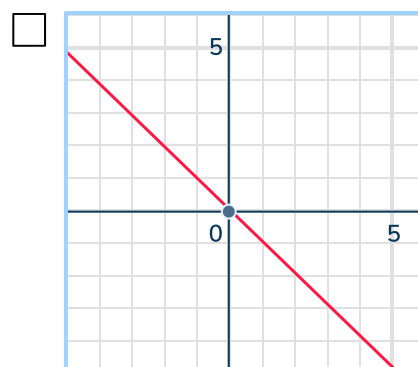
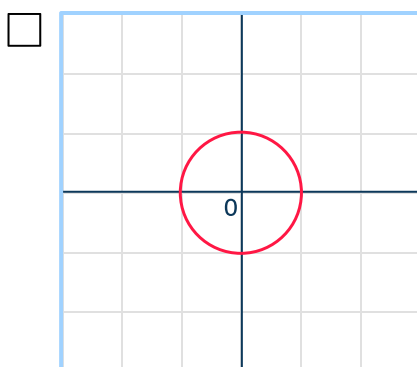
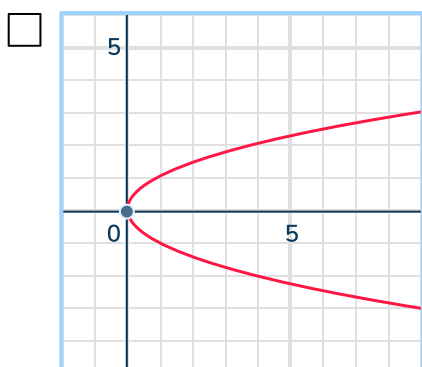
SESSION 1:

No Calculator

Standard: 8.F.A.1

DOK 1

1 Select the graphs that show y to be a function of x ?



Standard: 8.EE.A.1

DOK 2

- 2 Select the expressions that have a value of $\frac{1}{64}$

- ☐ 2^6
- ☐ $(2^3)^{-3}$
- ☐ $(2^5)^{-1}$
- ☐ $(2^3)^{-2}$
- ☐ 2^{-6}

Standard: 8.F.A.1

DOK 1

- 3 Select the set of points that does NOT represent a function.

- ☐ $\{(9, 0), (0, 9), (6, 5)\}$
- ☐ $\{(1, 1), (2, 1), (3, 1)\}$
- ☐ $\{(0, 0), (7, 1), (-6, 1)\}$
- ☐ $\{(5, 2), (-5, -2), (5, 10)\}$

Standard: 8.NS.A.2

DOK 2

- 4 What is a possible value for a in the inequality below?

$$6.2 < \sqrt{a} < 8.9$$

Answer: _____

Standard: 8.EE.A.2

DOK 2

- 5 Select the solution(s) to $x^2 = 100$?

- ☐ No solution
- ☐ 50
- ☐ -50
- ☐ 10
- ☐ -10


SESSION 2:

Calculator Permitted

Standard: 8.G.B.8

DOK 2

- 6 The points A(-1, 2) and B(3, -8) are plotted on the coordinate plane. What is the distance between the points?

 Answer

Standard: 8.F.B.4**DOK 3**

- 7 The table and the equation both show a different relationship between y and x .

Function A

x	y
2	3.5
3	5.25
5	8.75

Function B

$$y = \frac{3}{2}x$$

Select the statement about the functions that is true.

- ☐ The rate of change of Function A is less than the rate of change of Function B because $1.75 < 1.5$.
- ☐ The rate of change of Function A is greater than the rate of change of Function B because $1.75 > 1.5$.
- ☐ The rate of change of Function A is less than the rate of change of Function B because $0.75 < 0.5$.
- ☐ The rate of change of Function A is greater than the rate of change of Function B because $1.75 > 1.5$.

Standard: 8.G.C.9

DOK 2

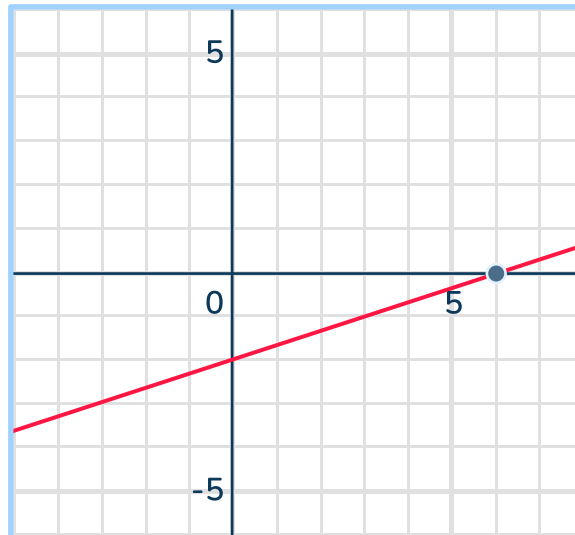
- 8 A water bottle is in the shape of a cylinder that has a diameter of 4 inches and a height of 9 inches. Create an equation that can be used to find the volume of the water bottle in cubic inches.

Answer:_____

Standard: 8.EE.B.6

DOK 2

- 9 Write an equation that represents the line on the coordinate plane



Answer: _____

Standard: 8.F.B.4**DOK 2**

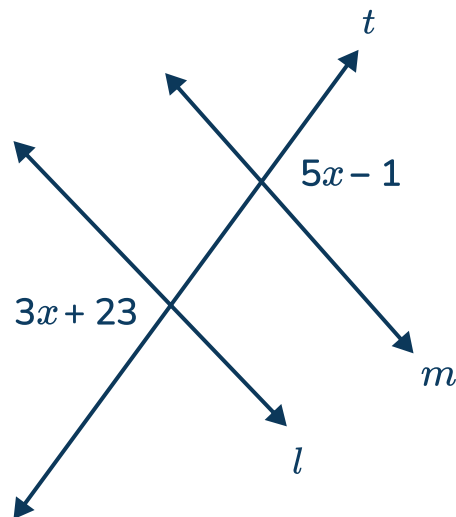
- 10** Gina runs her family's home repair service. The table below shows the service charges for the amount of hours worked. Create a linear equation that represents the information in the table.


Hours worked, x	Total amount of money charged, y
0	\$80
1	\$105
3	\$155
5	\$205

Answer:_____

Standard: 8.G.A.5**DOK 1**

- 11** In the figure, lines l and m are parallel and t is the transversal. What is the value of x ?



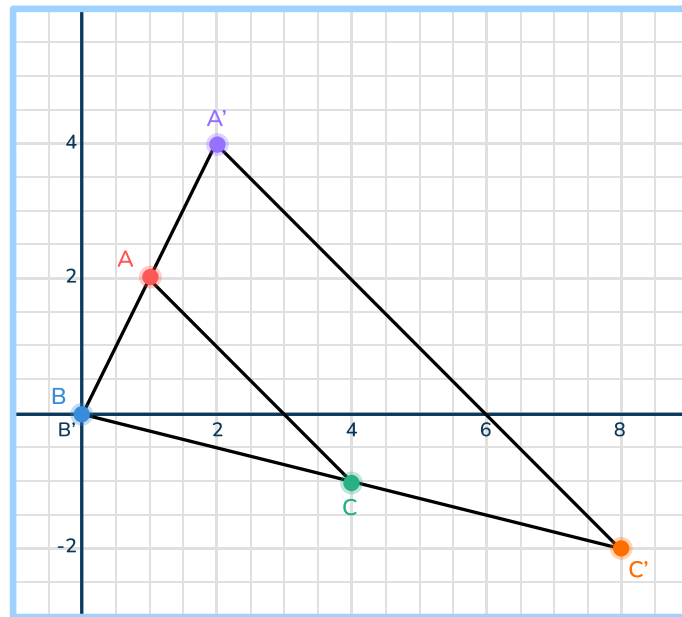
 Answer

Standard: 8.G.A.3

DOK 2

- 12 Kelly plotted triangle ACB and then performed a dilation that mapped triangle ACB to triangle A'B'C'. What is the scale factor of the dilation she performed?

Answer:_____



Answer:_____

Standard: 8.F.B.4

DOK 3

- 13 Daniella runs her own tutoring business. Due to the fact that gas prices are on the rise, Daniella charges all of her customers a \$5.00 fee plus \$60 an hour. Create a function of x that models the situation.

Answer:_____

Standard: 8.SP.A.2

DOK 2

- 14 Which is the best statement to describe the data in a scatter plot where the y -values are increasing as the x -values are decreasing?

- ☐ The data can be modeled by a horizontal line.
- ☐ The data cannot be modeled by a line.
- ☐ The data can be modeled by a line with a negative slope.
- ☐ The data can be modeled by a line with a positive slope.

Standard: 8.EE.B.6**DOK 2**

- 15** On the coordinate plane, the graph of a line passes through the origin and the point $(-8, 5)$. Write the equation of the line in slope intercept form.

Answer:_____

Standard: 8.EE.C.7**DOK 2**

- 16** Select the box that represents the type of solution for each equation.

Equation	No solution	1 solution	Infinite solutions
$2.5(3x - 2) = 2x + 0.5$			
$-4(x + 5) - 3x = -7x - 9$			
$2(3x - 7) - x = -1(-5x + 14)$			

Standard: 8.EE.C.8

DOK 1

- 17** Find the solution to the system of equations.

$$3x - 3y = 1$$

$$6x = 6y + 2$$

 Answer

Standard: 8.NS.A.1

DOK 1


18 Write $0.\overline{41}$ as a fraction.

Answer: _____

Standard: 8.G.B.7

DOK 3


- 19** Johanna is building a fence around her garden. She has 27 feet of fencing to enclose the right triangle shaped garden. If the two shorter sides of the triangular shaped garden are both 8 feet, will she have enough fencing to fully enclose the garden? Be sure to show all of your work in the space provided.

 Answer

Standard: 8.EE.A.4

DOK 3

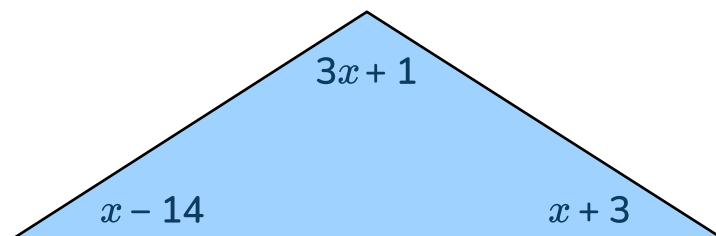
- 20 Saturn is 8.86×10^8 miles from the sun. Mercury is about 2.86×10^7 miles from the sun. What is the difference between Mercury's and Saturn's distance from the sun? Express your answer in scientific notation.

 Answer

Standard: 8.G.A.5

DOK 1

21 What is the value of x ?




Answer: _____

Standard: 8.EE.C.7

DOK 3

- 22** What value for k will make the equation have no solution?

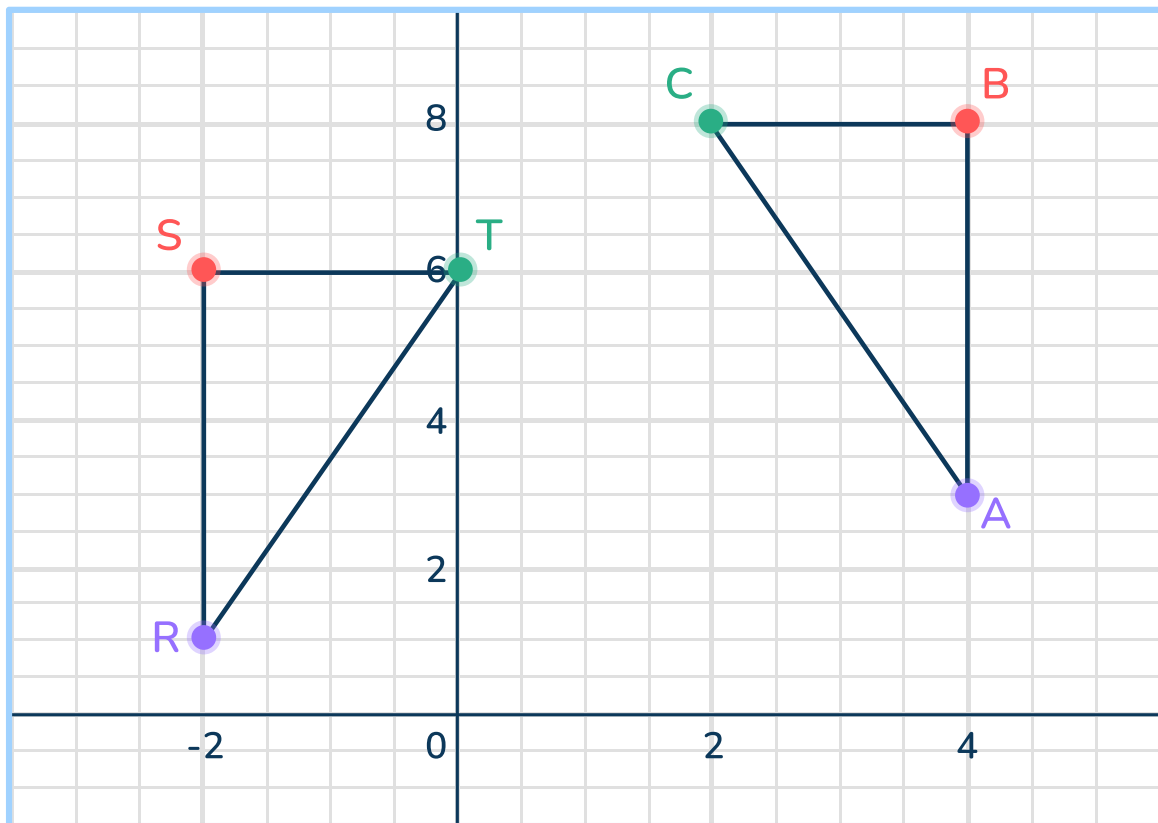
$$12x - 26 + 2 = k(3x - 9)$$

 Answer

Standard: 8.G.A.2

DOK 3

- 23 Select the sequence of transformations that maps triangle RST to triangle ABC.



- ☐ Reflection over the line $y = x$ followed by a translation of 2 units up and 2 units right.
- ☐ Translation of 2 units right and 2 units up followed by a reflection over the y -axis.
- ☐ Reflection over the y -axis followed by a translation of 2 units up and 2 units right.
- ☐ Reflection over the x -axis followed by a translation of 2 units up and 2 units right.

Standard: 8.F.A.3

DOK 3

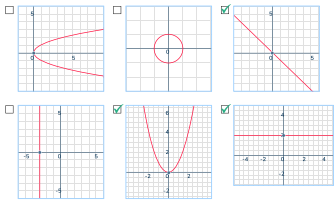
- 24** Using the three equations below. Identify each one of them as either linear or nonlinear. State a reason why each equation is either linear or nonlinear.

- $y = \frac{x}{4} + 3$

- $y = \frac{10}{x} - 4$

- $y = 2(-x + 4)$

Rationales

Item	KEY	Rationale
1		The diagonal line, parabola opened up and the horizontal line are all functions because they represent relations where for every x value there is only one y value. In other words, there is no repetition of x values.

Item	KEY	Rationale
2	$(2^3)^{-2}$ 2^{-6}	$(2^3)^{-2} = 2^{-6} = \frac{1}{2^6} = \frac{1}{64}$ $2^{-6} = \frac{1}{2^6} = \frac{1}{64}$

Item	KEY	Rationale
3	$\{(5, 2), (-5, -2), (5, 10)\}$	<p>This relation does not represent a function because there cannot be any repeat of the x-coordinate or the relationship will fail the vertical line test.</p> $\{(5, 2), (-5, -2), (5, 10)\}$

Item	KEY	Rationale
4	$a = 49$ or $a = 64$	<p>If $a = 49$, then \sqrt{a} is $\sqrt{49} = 7$</p> <p>If $a = 64$, then \sqrt{a} is $\sqrt{64} = 8$</p>

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Item	KEY	Rationale
5	$x = \pm 10$	$x^2 = 100$ $\sqrt{x^2} = \sqrt{100}$ $x = \pm 10$

Item	KEY	Rationale
6	10.8	<p>The student can use the distance formula or the Pythagorean Theorem to calculate the distance between the points.</p> $\sqrt{(-1 - 3)^2 + (2 - (-8))^2}$ $\sqrt{(-4)^2 + (10)^2}$ $\sqrt{16 + 100} = \sqrt{116} = 10.8$

Item	KEY	Rationale
7	The rate of change of Function A is greater than the rate of change of Function B because $1.75 > 1.5$.	<p>The rate of change of Function A is:</p> $\frac{3.5 - 5.25}{2 - 3} = \frac{-1.75}{-1} = 1.75$ <p>The rate of change of Function B is:</p> $y = \frac{3}{2}x$ $\frac{3}{2} \text{ or } 1.5$ <p>Rate of change is the slope.</p>

Item	KEY	Rationale
8	$V = \pi(2)^2(9)$	<p>The volume of a cylinder is $V = \pi(r^2)(h)$</p> <p>The radius, in this case, is 2 and the height is 9.</p> $V = \pi(2)^2(9)$

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Item	KEY	Rationale
9	$y = \frac{1}{3}x - 2$	The slope is $\frac{2}{6} = \frac{1}{3}$ and the y -intercept is -2 $y = \frac{1}{3}x - 2$

Item	KEY	Rationale
10	$y = 25x + 80$	Selecting 2 points from the table, (0,80) and (1, 105) the slope is $\frac{105-80}{1-0} = \frac{25}{1} = 25$ The y -intercept is identified as (0, 80) So the equation is $y = 25x + 80$

Item	KEY	Rationale
11	$x = 12$	The angles represented by the algebraic expressions are alternate exterior angles which are congruent or equal when the lines are parallel. $5x - 1 = 3x + 23$ $2x = 24$ $x = 12$

Item	KEY	Rationale
12	Scale factor is 2.	This is the correct answer. Comparing the points you can see the scale factor is 2 because each point from triangle ACB when multiplied by 2 will land on the points of triangle A'B'C'. $A(1, 2) \rightarrow 2(1,2) = A'(2, 4)$ $C(4, -1) \rightarrow 2(4,-1) = C'(8, -2)$ $B(0, 0) \rightarrow 2(0,0) = B'(0, 0)$

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Item	KEY	Rationale
13	$y = 60x + 5$	<p>The starting or initial fee is \$5 which is the y-intercept. Then there is a cost of \$60 per hour which represents the rate of change or the slope. So, the function is</p> $y = 60x + 5$

Item	KEY	Rationale
14	The data can be modeled by a line with a negative slope.	When the x -values decrease as the y -values increase the points will form a line that has a negative slope.

Item	KEY	Rationale
15	$y = -\frac{5}{8}x$	<p>The equation of a line in slope intercept form is $y = mx + b$ where m is the slope and b is the y-intercept. Find the slope:</p> $\frac{5-0}{-8-0} = -\frac{5}{8}$ <p>Since the line passes through the origin, the origin is the y-intercept.</p> <p>Another way to find the equation is to plot the origin and the point $(-8, 5)$ on a graph. Starting at the origin, which is the y-intercept, count the vertical movement and the horizontal movement until you get to the point $(-8, 5)$</p> <p>The equation is: $y = -\frac{5}{8}x + 0$ or</p> $y = -\frac{5}{8}x$

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Item	KEY	Rationale
16	$2.5(3x - 2) = 2x + 0.5$, 1 solution $-4(x + 5) - 3x = -7x - 9$, no solution $2(3x - 7) - x = -1(-5x + 14)$, infinite solutions	$2.5(3x - 2) = 2x + 0.5$ $7.5x - 5 = 2x + 0.5$ $5.5x = 5.5$ $x = 1$ $-4(x + 5) - 3x = -7x - 9$ $-4x - 20 - 3x = -7x - 9$ $-7x - 20 = -7x - 9$ $-20 = -9$ (not true so no solution) $2(3x - 7) - x = -1(-5x + 14)$ $6x - 14 - x = 5x - 14$ $5x - 14 = 5x - 14$ $-14 = -14$ (true so infinite solutions)

Item	KEY	Rationale
17	Infinite solutions	Solving the system using elimination: $3x - 3y = 1$ $6x = 6y + 2$ $3x - 3y = 1$ $6x - 6y = 2$ $2(3x - 3y = 1)$ $6x - 6y = 2$ $6x - 6y = 2$ $6x - 6y = 2$ These lines coincide meaning there are infinite solutions.

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Item	KEY	Rationale
18	$\frac{41}{99}$	$0.\overline{41}$ $x = 0.414141...$ $100x = 41.41414... \text{ (multiply both sides of the equation by 100)}$ Subtract the two equations. $100x = 41.414141.$ $-x = 0.414141...$ $99x = 41 \text{ (solve the equation for } x)$ $x = \frac{41}{99}$

Item	KEY	Rationale
19	She will not have enough fencing	$8^2 + 8^2 = x^2$ $64 + 64 = x^2$ $128 = x^2$ $11.3 = x$ The triangular garden has a perimeter of $8 + 8 + 11.3 = 27.3$ If Johanna only has 27 feet of fencing she will not have enough to enclose the triangular shaped garden.

Item	KEY	Rationale
20	8.574×10^8 miles	$8.86 \times 10^8 - (2.86 \times 10^7)$ – rewrite so they have the same exponent $88.6 \times 10^7 - (2.86 \times 10^7)$ 85.74×10^7 8.574×10^8 miles

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Item	KEY	Rationale
21	$x = 38$	All the angles in a triangle sum to 180. $x - 14 + 3x + 1 + x + 3 = 180$ $5x - 10 = 180$ $5x = 190$ $x = 38$

Item	KEY	Rationale
22	$k = 4$	This is the correct answer. If $k = 4$ then, $12x - 26 + 2 = k(3x - 9)$ $12x - 26 + 2 = 4(3x - 9)$ $12x - 24 = 12x - 36$, no solution $-24 \neq 36$

Item	KEY	Rationale
23	Reflection over the y -axis followed by a translation of 2 units up and 2 units right.	$R(-2, 1) \rightarrow (2, 1) \rightarrow A(4, 3)$ $S(-2, 6) \rightarrow (2, 6) \rightarrow B(4, 8)$ $T(0, 6) \rightarrow (0, 6) \rightarrow C(2, 8)$

Item	KEY	Rationale
24	$y = \frac{x}{4} + 3$ linear $y = \frac{10}{x} - 4$ nonlinear $y = 2(-x + 4)$ linear	$y = \frac{x}{4} + 3 \rightarrow$ This is a linear equation because it can be rewritten in the form $y = mx + b$, $y = \frac{1}{4}x + 3$. The variable x is to the first power and it is the highest power of the equation meaning that it is linear. When it is graphed, the slope of the line is $\frac{1}{4}$ and the y -intercept is 3. $y = \frac{10}{x} - 4 \rightarrow$ This is a nonlinear equation because x is to the -1 power. $y = 10x^{-1} - 4$. Linear equations have a degree of 1 or in other words x has to be to the 1 power. Also the equation cannot be written in the form of $y = mx + b$ $y = 2(-x + 4) \rightarrow$ This is linear equation because the highest exponent for x is 1. The equation can be rewritten to be $y = -2x + 8$ which is in the form of $y = mx + b$




Breakdown of Assessment				
The Number System	Expressions, Equations, and Inequalities	Functions	Geometry	Statistics and Probability
2%	40%	19%	40%	2%

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-  thirdspacelearning.com/us/
-  +1 929-298-4593
-  hello@thirdspacelearning.com



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